

Задания вопроса СЗ

Напишите уравнения реакций, с помощью которых можно осуществить следующие превращения:

- $$\text{Al}_4\text{C}_3 \xrightarrow{\text{H}_2\text{O}} \text{X}_1 \xrightarrow{1500^\circ\text{C}} \text{X}_2 \xrightarrow{\text{C}_{(\text{АКТ})}, t^\circ} \text{X}_3 \rightarrow$$

$$\xrightarrow{\text{Br}_2, \text{AlBr}_3} \text{X}_4 \xrightarrow{\text{NH}_3, \text{p}, t^\circ} \text{X}_5.$$
- $$\text{Al}_4\text{C}_3 \xrightarrow{\text{H}_2\text{O}} \text{X}_1 \xrightarrow{t^\circ} \text{X}_2 \rightarrow \text{этаналь} \xrightarrow[\text{H}_2\text{O}]{\text{KMnO}_4} \text{X}_3 \rightarrow \text{X}_1.$$
- $$\text{CH}_4 \rightarrow \text{HCHO} \xrightarrow{\text{H}_2 \text{ кат.}} \text{X}_1 \xrightarrow{\text{Na}} \text{X}_2 \xrightarrow{\text{HCl}}$$

$$\rightarrow \text{X}_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4} \text{X}_3.$$
- $$\text{CH}_4 \xrightarrow{1500^\circ\text{C}} \text{X}_1 \rightarrow \text{C}_6\text{H}_6 \xrightarrow{\text{CH}_3\text{Cl}, \text{AlCl}_3} \text{X}_2 \xrightarrow{\text{KMnO}_4, \text{H}^+}$$

$$\rightarrow \text{X}_3 \xrightarrow{\text{C}_2\text{H}_5\text{OH}, \text{H}^+} \text{X}_4.$$
- $$\text{CH}_4 \xrightarrow{1500^\circ\text{C}} \text{X}_1 \xrightarrow{t^\circ, \text{кат.}} \text{винилацетилен} \xrightarrow{\text{изб. H}_2, \text{кат.}}$$

$$\rightarrow \text{X}_2 \xrightarrow{\text{O}_2, t^\circ, \text{кат.}} \text{этановая кислота} \xrightarrow{\text{NH}_3} \text{X}_3.$$
- $$\text{C}_2\text{H}_6 \xrightarrow{\text{Br}_2} \text{X}_1 \xrightarrow{\text{KOH}, \text{H}_2\text{O}} \text{X}_2 \xrightarrow{\text{K}_2\text{Cr}_2\text{O}_7, \text{H}_2\text{SO}_4, \text{H}_2\text{O}}$$

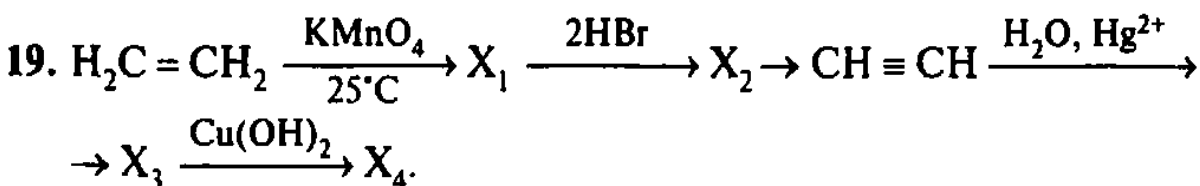
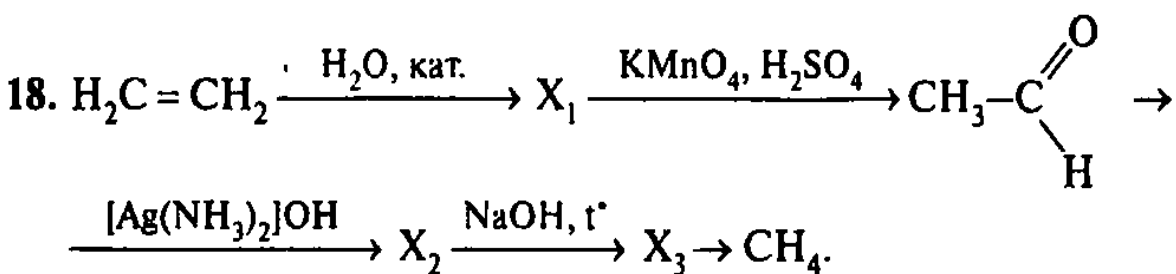
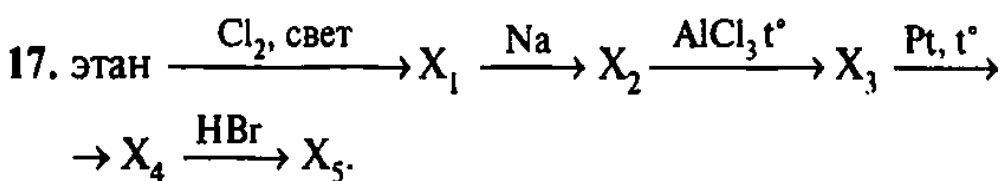
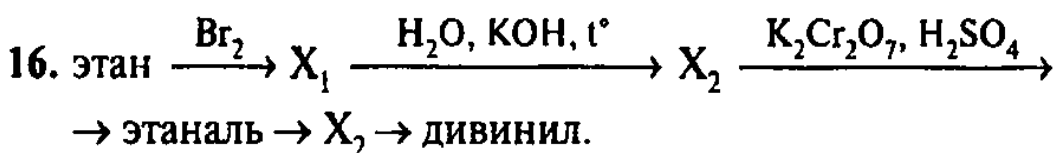
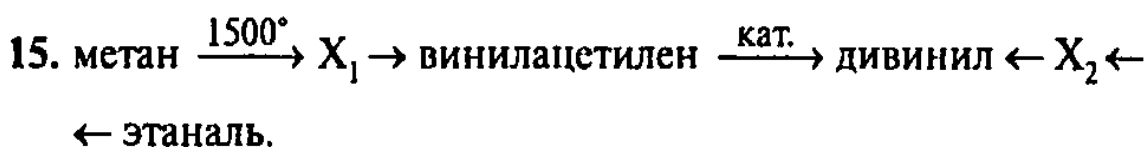
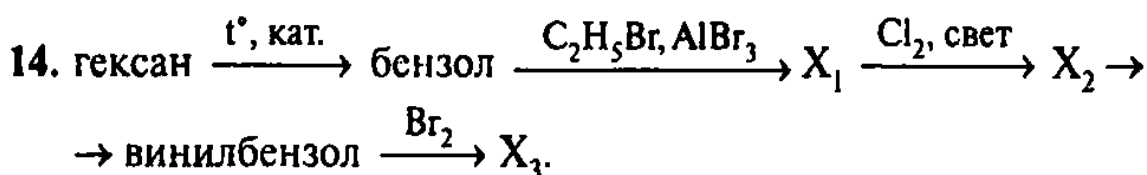
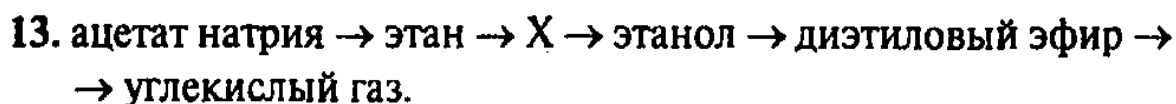
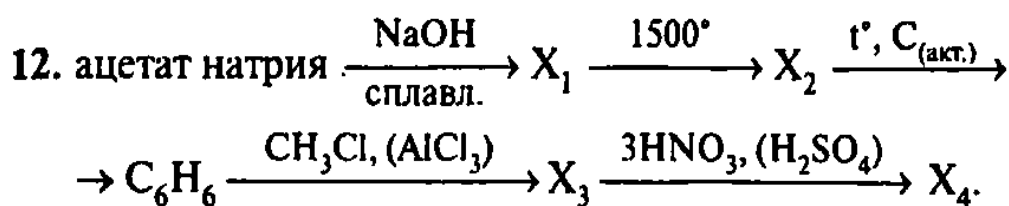
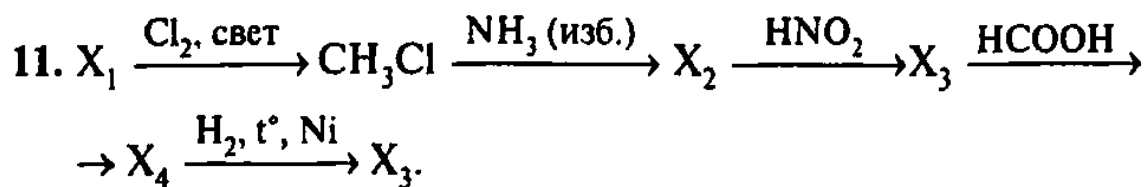
$$\rightarrow \text{CH}_3\text{CHO} \rightarrow \text{X}_2 \xrightarrow{t^\circ, \text{кат.}} \text{дивинил}.$$
- $$\text{C}_2\text{H}_6 \xrightarrow{\text{HNO}_3, t^\circ} \text{X}_1 \xrightarrow{\text{H}_2, t^\circ, \text{кат.}} \text{X}_2 \xrightarrow{\text{HBr}} \text{X}_3 \xrightarrow{\text{NaOH}} \text{X}_2 \rightarrow$$

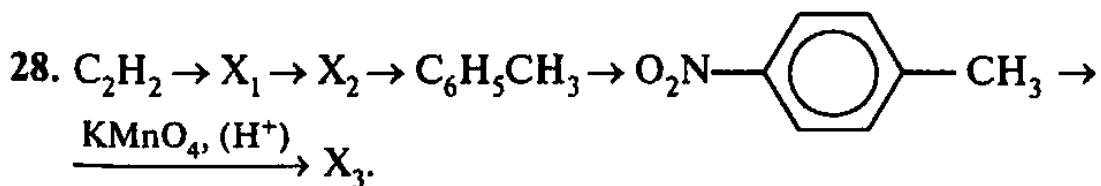
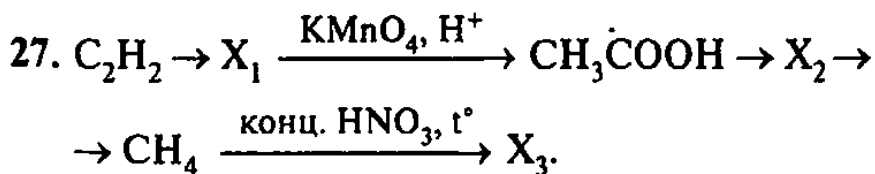
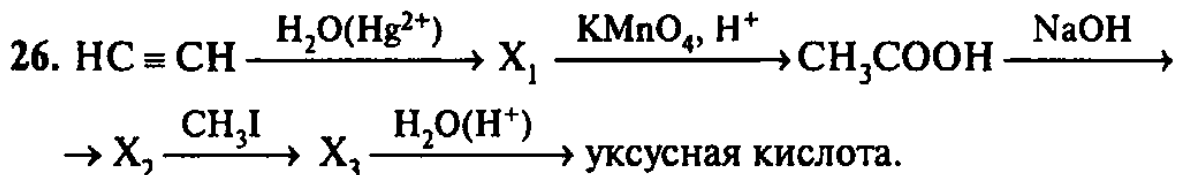
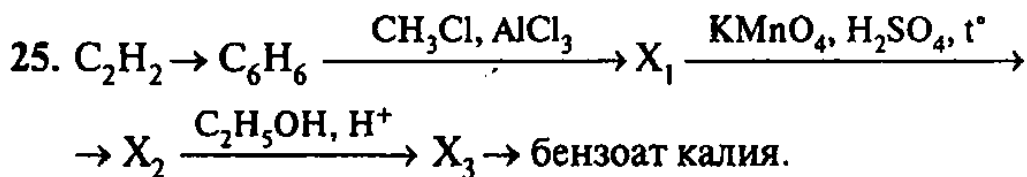
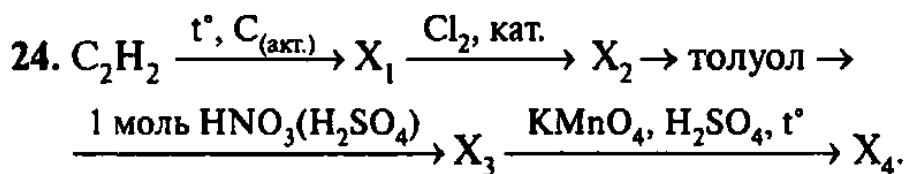
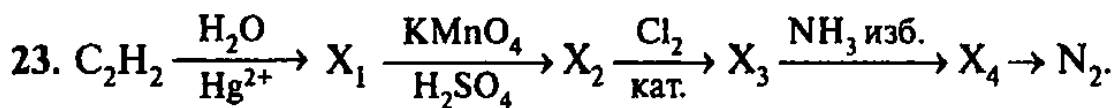
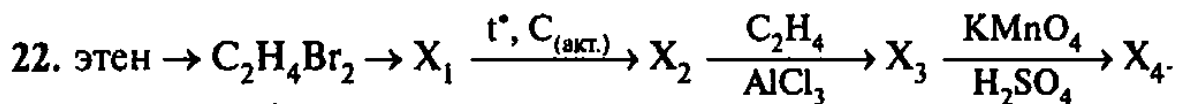
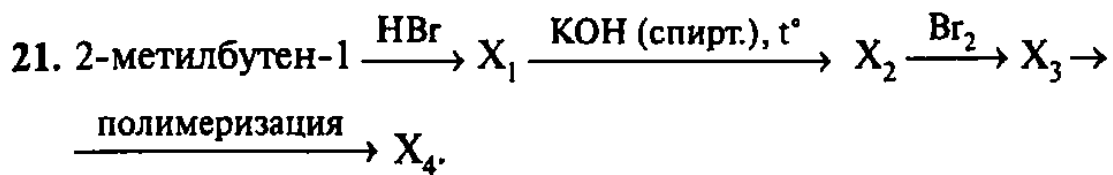
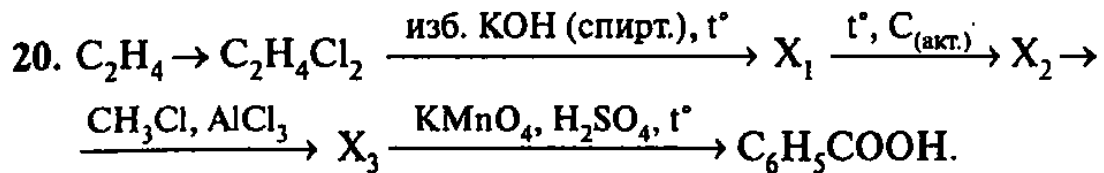
$$\xrightarrow{\text{C}_2\text{H}_5\text{Br}} \text{X}_4.$$
- $$\text{C}_4\text{H}_{10} \xrightarrow{t^\circ, \text{кат.}} \text{X}_1 \xrightarrow{\text{Br}_2, 40^\circ\text{C}} \text{X}_2 \rightarrow$$

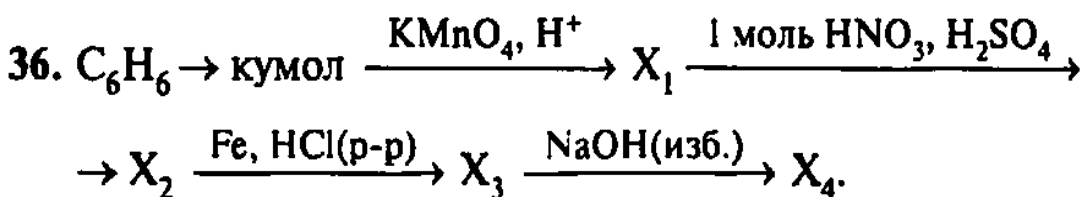
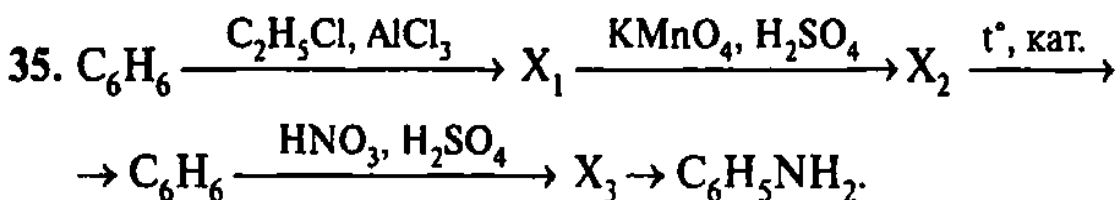
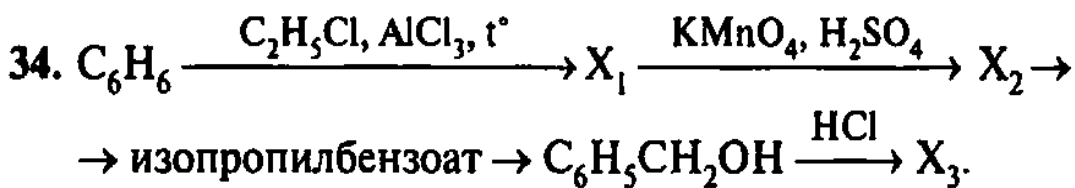
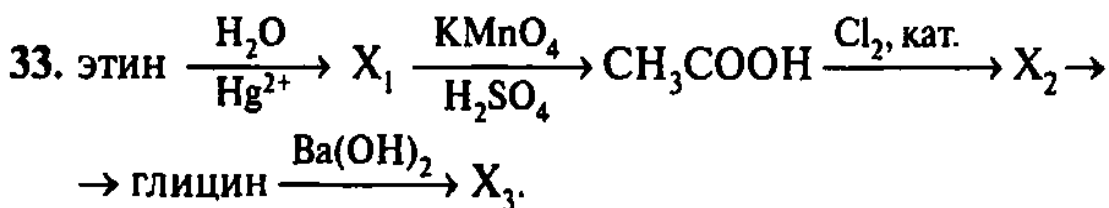
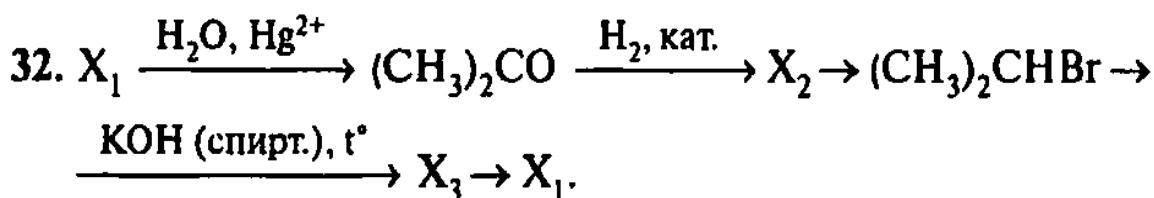
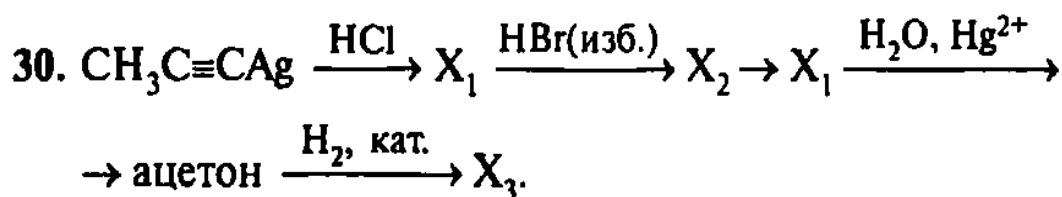
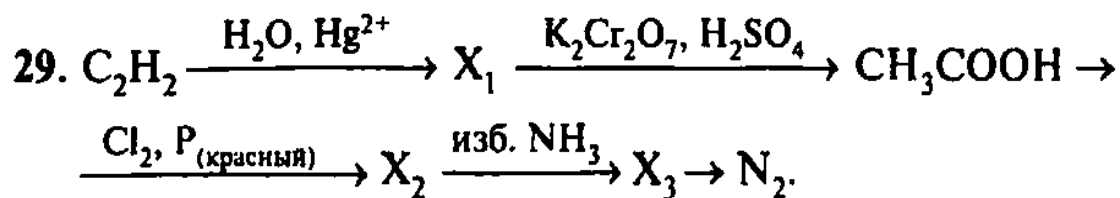
$$\rightarrow \text{1,4-дибромбутан} \xrightarrow{\text{KOH (водн.)}} \text{X}_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4} \text{X}_4.$$
- $$\text{n-C}_4\text{H}_{10} \xrightarrow{t^\circ, \text{кат.}} \text{X}_1 \rightarrow \text{1,4-дибромбутен-2} \xrightarrow{\text{NaOH (водн.)}}$$

$$\rightarrow \text{X}_2 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4} \text{X}_3 \xrightarrow{\text{Na}} \text{X}_4.$$
- $$\text{X}_1 \xrightarrow{\text{Br}_2, \text{свет}} \text{CH}_3\text{Br} \xrightarrow{\text{NH}_3 (\text{изб.})} \text{X}_2 \xrightarrow{\text{HNO}_2} \text{X}_3 \xrightarrow{\text{CuO}, t^\circ}$$

$$\rightarrow \text{H}_2\text{CO} \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4} \text{X}_4.$$







37. $C_6H_6 \xrightarrow{C_2H_5Br, \text{кат.}} X_1 \xrightarrow{Br_2, \text{свет}} X_2 \xrightarrow{NaOH (\text{водн.})} \rightarrow X_3 \xrightarrow[t > 170^\circ C]{H_2SO_4} X_4 \xrightarrow{\text{полимеризация}} X_5.$
38. толуол $\xrightarrow{Cl_2, \text{свет}} X_1 \xrightarrow{NaOH (\text{водн.})} X_2 \xrightarrow{KMnO_4, H_2SO_4} \rightarrow C_6H_5-COOH \xrightarrow{Na} X_3 \xrightarrow[\text{сплавление}]{NaOH (\text{тв.})} X_4.$
39. $CH_3Cl \rightarrow X_1 \rightarrow C_2H_5NO_2 \rightarrow C_2H_5NH_2 \xrightarrow{HCl} X_2 \xrightarrow{KOH} X_3.$
40. $C_2H_5Cl \rightarrow C_3H_8 \xrightarrow{Pt, t^\circ} X_1 \xrightarrow{KMnO_4, H_2O} X_2 \xrightarrow{HBr (\text{изб.})} \rightarrow X_3 \xrightarrow{\text{изб. KOH (спирт.), } t^\circ} X_4.$
41. $CH_3CHCl_2 \rightarrow CH_3CHO \xrightarrow{H_2, t^\circ, \text{кат.}} X_1 \xrightarrow{NH_3, 300^\circ, \text{кат.}} \rightarrow C_2H_5-NH_2 \xrightarrow{CO_2 + H_2O} X_2 \xrightarrow{t^\circ} X_3.$
42. $C_2H_4Br_2 \xrightarrow{KOH (\text{спирт.}), t^\circ} X_1 \xrightarrow{H_2O, Hg^{2+}} X_2 \rightarrow \xrightarrow{KMnO_4, H_2SO_4} CH_3COOH \xrightarrow{Cl_2, \text{свет}} X_3 \rightarrow H_2NCH_2COOH.$
43. $CH_2BrCH_2CH_2Br \xrightarrow{Zn} X_1 \xrightarrow{HBr, t^\circ} X_2 \rightarrow \text{пропен} \rightarrow \xrightarrow{KMnO_4, H_2SO_4} X_3 \xrightarrow{HBr (\text{изб.})} X_4.$
44. $CH_3CH_2CH_2Br \xrightarrow{Na} X_1 \xrightarrow{Pt, t^\circ} X_2 \xrightarrow{CH_3Cl, AlCl_3} \rightarrow X_3 \xrightarrow{KMnO_4, H^+} X_4 \xrightarrow{CH_3OH, H^+} X_5.$
45. 1-бромпропан $\xrightarrow{Na} X_1 \xrightarrow{t^\circ, \text{кат.}} X_2 \xrightarrow{AlCl_3, CH_3Cl} \rightarrow X_3 \xrightarrow{KMnO_4, H_2SO_4} C_6H_5COOH \xrightarrow{NaOH} X_4.$

46. 2-хлорбутан $\xrightarrow{\text{NaOH(спирт.)}, t^\circ}$ $X_1 \xrightarrow[\text{H}_2\text{SO}_4]{\text{KMnO}_4, t^\circ}$ $X_2 \rightarrow$
 $\xrightarrow{\text{Cl}_2 (\text{P}_{\text{красн.}}, t^\circ)}$ $X_3 \rightarrow$ аминокислота \rightarrow
 $\xrightarrow{\text{бутанол-2, кат.}, t^\circ}$ X_4 .
47. 1-хлорпропан $\xrightarrow{\text{Na}}$ $X_1 \xrightarrow{\text{Pt}, t^\circ}$ $X_2 \xrightarrow{\text{C}_2\text{H}_5\text{Cl}, \text{AlCl}_3}$ \rightarrow
 $\rightarrow X_3 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4}$ $X_4 \xrightarrow{\text{PCl}_5}$ X_5 .
48. $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{Br} \rightarrow X_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}, t^\circ}$ $\text{CH}_3\text{COOK} \rightarrow$
 $\xrightarrow{\text{KOH (сплав.)}}$ $X_2 \rightarrow \text{CH} \equiv \text{CH} \xrightarrow{[\text{Ag}(\text{NH}_3)_2]\text{OH}}$ X_3 .
49. 1-хлорбутан $\xrightarrow{\text{NaOH(спирт.)}, t^\circ}$ $X_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{SO}_4}$ \rightarrow
 \rightarrow пропионовая кислота \rightarrow изопрропилпропионат \rightarrow
 $\xrightarrow{\text{NaOH(водн.)}, t^\circ}$ $X_2 \xrightarrow{\text{NaOH}_{\text{(тв.)}}, \text{сплав.}}$ X_3 .
50. $\text{CH}_3\text{ONa} \xrightarrow{\text{H}_2\text{O}}$ $X_1 \rightarrow$ метилбромид $\xrightarrow{\text{Na}, t^\circ}$ $X_2 \xrightarrow{t^\circ, \text{Ni}}$ \rightarrow
 $\rightarrow X_3 \xrightarrow{\text{O}_2, \text{PdCl}_2}$ этаналь.
51. $\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{Al}_2\text{O}_3, 400^\circ}$ $X_1 \xrightarrow{\text{KMnO}_4, \text{H}_2\text{O}}$ $X_2 \xrightarrow{\text{HBr(изб.)}}$ \rightarrow
 $\rightarrow X_3 \xrightarrow{\text{изб. KOH (спирт.)}, t^\circ}$ $X_4 \rightarrow \text{C}_2\text{H}_4\text{O}$.
52. $\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{HBr}}$ $X_1 \xrightarrow{\text{KOH (спирт.)}, t^\circ}$ $X_2 \xrightarrow{\text{кат.}}$ $\text{C}_6\text{H}_5\text{C}_2\text{H}_5 \rightarrow$
 $\xrightarrow{\text{Br}_2 \text{ свет}}$ $X_3 \xrightarrow{\text{KOH (спирт.)}, t^\circ}$ X_4 .
53. $\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{HBr}}$ $X_1 \xrightarrow{\text{Mg, эфир}}$ $X_2 \xrightarrow{\text{CO}_2}$ $X_3 \xrightarrow{\text{H}_2\text{O}}$ $X_4 \rightarrow$
 $\xrightarrow{\text{Br}_2, \text{P}_{\text{красный}}}$ X_5 .